

by cross-bred sheep, which are not so delicate in their tastes as the merino. It is therefore evident that the clearing-away of the undergrowth of the bush, and the compression of the humus and rotten wood by the animals grazing thereon, deprive the rats of their places of concealment, causing them to leave the bush and to seek food elsewhere. The stimulus given to sheep-farming by the development of the frozen meat trade has made farmers increase their flocks and use every available piece of land for pasturage. As the scrub of the bush growing on sloping spurs becomes cleared by sheep, there is the most reassuring prospect that many of the species now becoming rare will be re-established in a few years, and this apparently is one of the causes favouring the slow increase of the native honey-eaters and other species inhabiting the bush in Canterbury. In addition to the visits of *Anthornis melanura* to the blooming acacia trees in spring, the birds have of late years attacked the ripening apples on the trees in the orchards near the bush, and on that account do not get a very good name from their unkindly owners.

At the present time when the attention of naturalists is drawn towards our remarkable birds, and the apparently inevitable fate of many species, any reassuring remarks concerning any of them will, no doubt, be welcome. But in the forests of Westland, where rats are numerous and weasels and stoats are increasing, there is at present little hope of saving them from extinction. It is truly a melancholy prospect to know that many of the species belonging to the most remarkable avifauna ever evolved in any zoological region are rapidly vanishing from the earth, and that there are no apparent means available to counteract the catastrophe.

XLVII.—*A List of the Birds inhabiting the Chatham Islands.*

By H. O. FORBES, F.R.G.S., M.B.O.U.

(Plates XIV., XV.)

THE Chatham Islands, which form a portion of the New-Zealand region, lie in about S. lat. 44° and W. long. 176° 30',

some 500 miles east and a very little south of the latitude of Lyttelton, in the province of Canterbury, N.Z. The group consists of about a dozen separate islands, of which Wharekauri (Chatham Island) is the largest, and Rangiauria (or Pitt's Island), to its south-east, the next in size. On the east side of Pitt's Island lies Rangatira (or South-east Island), the third largest of the group, and off its west coast is situated the small islet of Mangare and other rocks and fragments of land. To the north and west of Cape Young, a promontory of Wharekauri, lies the rocky group of the Sisters, or Rangitutahi. Still further to the east of the main island than any of its satellites which I have named, the sea washes round Matahara, or the Forty-fours, rocks so-named from their lying all but on the 44th degree of South latitude*.

This little archipelago was discovered by H.M.S. 'Chatham,' the companion of H.M.S. 'Discovery,' the vessels which formed the expedition of Captain Vancouver in the Pacific Ocean from 1790 to 1795. The two vessels were parted from each other during a storm, after their departure from New Zealand, and did not sight each other again till their port of rendezvous in Tahiti was reached. Each had then to report a discovery, the 'Chatham' having found the island of Wharekauri, on which her commander, Lieut. Broughton, landed and conferred its name in honour of the Earl of Chatham, while the 'Discovery' had narrowly escaped disaster upon a low rocky islet to the south of New Zealand, to which Capt. Vancouver gave the significant name of "The Snares," from its dangerous position in the fairway of vessels rounding the southern end of New Zealand. Both islands have proved of much ornithological interest.

Sir Walter Buller, in the second edition of his 'History of the Birds of New Zealand,' has in most instances mentioned the species found in the Chatham Islands. Since the

* [On these Islands generally, see "An Account of the Chatham Islands," by Dr. E. Dieffenbach (Journ. R. Geogr. Soc. xi. p. 195 (1841); and "The Chatham Islands: their relation to a former Southern Continent," by H. O. Forbes (Suppl. Papers R. Geogr. Soc. vol. iii. p. 607 (1893).—ED.]

publication of that work, however, a good deal of additional information has been obtained through the collections made there at the expense of the Hon. Walter Rothschild, and through the exertions of my excellent correspondent Mr. Hawkins, after the visit I was fortunate enough to be able to pay to the islands in January 1892. On that occasion my time was chiefly devoted to the investigation of the extinct avifauna, and I could give but a very small portion of it to the study of the species now living there. I was happily, however, able to persuade Mr. Hawkins, who was my guide and assistant on that occasion, to undertake the task of collecting and observing the species inhabiting the different islands. To his exertions therefore I am indebted for much of the material on which the present communication is founded. I had specially drawn his attention to the interest attaching to the two known species of *Cabalus* (*C. dieffenbachi* and *C. modestus*), and I am sure that ornithologists will agree with me that our best thanks are due to him for the thorough way in which his search has been conducted, and which has resulted in the re-discovery of the long-lost *Cabalus modestus*. His investigations have, however, I fear, made it certain that *C. dieffenbachi*, of which the last specimen was obtained by Dr. Dieffenbach half a century ago on the main island, has ceased to exist. The same fate, I regret to think, awaits *C. modestus*, as I learn that cats have been introduced into the isolated islet-home where this bird has survived so long, for the purpose of exterminating the rabbits. These pernicious rodents, having somehow obtained a footing there, are devouring the pasture intended for the flocks, of the wool and flesh of which the struggle of civilization has necessitated that even a so distant, small, and inaccessible sea-girt rock shall contribute its quota.

Since the colonization of the Chatham Islands, both by Maoris and Europeans, about fifty years ago, the birds have lamentably decreased in number. Dr. Dieffenbach, the Naturalist to the New-Zealand Company, who visited the archipelago in 1840, has left it on record * that " vast flocks

* See J. R. G. S. vol. xi. p. 207.

of the common Grey Duck, Snipes, Plovers, Curlews, and Red-bills inhabit the lakes and sea-shores, and a Sand-Lark, which builds its nest on the ground, abounds in the bushes of *Phormium* [the New-Zealand flax] and fern. In summer the ducks' eggs furnish the natives with a favourite article of food. The forest is enlivened by numerous Tuis, or Mocking-birds." Some of these birds have become scarce, for the introduction of cats, dogs, and especially pigs, and the constant persecution of every sort of bird—indeed, of every living thing—by the natives, have produced, and are still producing, the inevitable result—the slow but certain extermination of all the original land-birds.

I now proceed to enumerate the birds of the Chatham Islands, giving references to the last edition of the 'Birds of New Zealand.'

1. MIRO TRAVERSI.

Miro traversi, Buller, Birds of N. Z. 2nd ed. i. p. 38.

Found on Mangare islet. I have received specimens marked also "Little Mangare."

2. MYIOMOIRA MACROCEPHALA.

Myiomoira macrocephala, Buller, op. cit. i. p. 42.

This bird occurs also in South Island of New Zealand and on the Auckland Islands.

3. GERYGONE ALBOFRONTATA.

Gerygone albofrontata, Buller, op. cit. i. p. 49.

4. SPHENÆACUS RUFESCENS.

Sphenæacus rufescens, Buller, op. cit. i. p. 62.

This bird has, I fear, now become extinct on the group.

5. ANTHUS NOVÆ-ZEALANDIÆ.

Anthus novæ-zealandiæ, Buller, op. cit. i. p. 63.

Still abundant on most of the islands.

6. RHIPIDURA FLABELLIFERA.

Rhipidura flabellifera, Buller, op. cit. i. p. 69.

7. RHIPIDURA FULIGINOSA.

Rhipidura fuliginosa, Buller, op. cit. i. p. 72.

8. *ZOSTEROPS CÆRULESCENS.*

Zosterops cærulescens, Buller, op. cit. i. p. 77.

These birds at certain seasons frequent the shores of Hanson's Bay in myriads, feeding on the little sand-hoppers (crustacea of the Amphipodous group).

9. *PROSTHEMADERA NOVÆ-ZEALANDIÆ.*

Prothemadera novæ-zealandiæ, Buller, op. cit. i. p. 91.

10. *ANTHORNIS MELANURA.*

Anthornis melanura, Buller, op. cit. i. p. 85.

This bird is found on Wharekauri, Rangiauria (Pitt's Island), and on the small islet of Mangare, where it lives in association with *A. melanocephala*.

Several skins of young birds received from Mangare, which for the present I attribute to this species, are much larger and of a darker green on the underside than the specimens of young and females of *A. melanura* from New Zealand in the British Museum. They may represent a new species; if so, they belong to the group *A. melanura*; for they possess the pale breast-plumes under the angle of the wing which are so characteristic of the young and old of both sexes of that species, and which are absent in the type of *A. melanocephala* in the National Collection, the only specimen of this species I have been able to examine.

11. *ANTHORNIS MELANOCEPHALA.*

Anthornis melanocephala, Buller, op. cit. i. p. 92.

My specimens were obtained on Little Mangare, which is, according to Mr. Hawkins, "now terribly difficult to reach, as the cliffs have fallen down."

Dr. Dieffenbach noted in 1840 that "the Mako-mako, the finest songster in New Zealand, is also found here, and is larger than it is there, which raises the suspicion of its being another species of the Honey-eater" (J. R. G. S. xi. p. 207).

The museum of the Hon. W. Rothschild at Tring contains, I understand, a large series of this species.

12. *EUDYNAMIS TAITENSIS.*

Eudynamis taitensis, Buller, op. cit. i. p. 127.

13. *CHRYSOCOCCYX LUCIDUS*.

Chrysococcyx lucidus, Buller, op. cit. i. p. 132.

The Shining Cuckoo which visits the Chatham Islands is of the same species as the Australian, which is found in New Zealand also. The belief some time prevalent, therefore, that one species migrated to New Zealand, and that a different species passed to the Chatham Islands, but did not rest in New Zealand, is quite a mistake.

14. *CYANORHAMPHUS NOVÆ-ZEALANDIÆ*.

Platycercus novæ-zealandiæ, Buller, op. cit. i. p. 137.

This bird was, in Dieffenbach's time, 1840, very much more abundant than it is now. It is found on Wharekauiri and on Rangiauria, but not on Mangare, where *Cyanorhamphus forbesi* only occurs.

Dr. Dieffenbach, in the account of his visit to the Chatham Islands (J. R. G. S. vol. xi. p. 207), observes that "a little green Parroquet flocks in hundreds to the potato-fields, and proves a great nuisance to the farmer by picking up the seed as soon as it is sown. This bird is generally a little larger than the New-Zealand Parroquet, and is perhaps a different species."

15. *CYANORHAMPHUS FORBESI*.

Platycercus auriceps, Travers, Tr. N.Z. Inst. v. p. 216; Buller, op. cit. i. p. 142.

Cyanorhamphus forbesi, Rothsch. P. Z. S. 1893, p. 529.

At the meeting of the British Ornithologists' Club on the 17th of May last I exhibited a skin of this bird which I had obtained from my correspondent, Mr. W. Hawkins, in the Chatham Islands, and observed that it seemed to me to differ from *Cyanorhamphus auriceps* of New Zealand in several points, but that my limited material did not enable me to come to a decision upon the subject. The Hon. Walter Rothschild, in whose collection there is an unrivalled series from the same locality, has investigated the question and has arrived at the conclusion that the species from the Chatham Islands differs from that on the mainland. He has done me the honour to associate my name with the species. It is found on the little islet of Mangare.

Its eggs are pure white and rotundo-ovoid in shape. The only two eggs which I have seen measure 1.05×0.85 and 1.00×0.85 .

16. *CIRCUS GOULDI*.

Circus gouldi, Buller, op. cit. i. p. 206.

This bird is now becoming very rare on the group. I found its remains, associated with those of other extinct birds, far from uncommon, showing that at one time it must have been much more abundant than it is now.

17. *CARPOPHAGA CHATHAMENSIS*.

Carpophaga novæ-zealandiæ, Buller, op. cit. i. p. 229.

Carpophaga chathamensis, Rothsch. P. Z. S. 1891, p. 312.

Carpophaga chathamica, H. O. Forbes, Nature, vol. xlv. p. 252 (1892).

Carpophaga chathamensis, Salvadori, Cat. B. vol. xxi. p. 252.

The native name is "Kuku," or "Kukupu" according to Dr. Dieffenbach. I obtained my first specimen of this bird on the 31st of January, 1892; it was shot for me by Mr. Hawkins at a great altitude with his rifle. On its fall I was surprised to observe that it appeared quite distinct from the New-Zealand species—although I could scarcely think it possible that it should have been overlooked by three such good ornithologists as Dr. Dieffenbach, Mr. Travers, and Mr. Potts, who must all have eked out their scanty provisions there by feeding on these Pigeons. This was nevertheless the case. I consequently proposed and published, with a short description in 'Nature' (*loc. cit.*), the name of *C. chathamica* for the species, in which I was, however, anticipated by Mr. Rothschild, whose collectors had obtained it the year before and sent it to Tring.

This Pigeon is now becoming scarce, and at present is most abundant on the south coast, where it loves to play in the strong up-current that towers into the air, rebounding from the perpendicular face of the cliffs, when a strong sea-breeze is blowing; and on the north coast, on the estate of Mr. Chudleigh, who does all he can to protect the native birds, by prohibiting their being shot on his property.

"The old Maoris and Maorioris say," writes Mr. Hawkins, "that years ago, at a certain time of the year, the Pigeons used to come in thousands : in fact, that you could sit under a tree on one of the little rises in the bush and spear thirty to forty in an afternoon. A singular fact about them was that in their crops and maws there was nothing but kelp, and that they all landed on the high land round Waitangi where the township now is ; [that is, on the west coast of the portion of the island to the south of Petre Bay]. They came in the early spring, about August." However this may be, this Pigeon feeds also on the fruit of the "Karaka" (*Corynocarpus laevigatus*), likewise on the berries of a species of *Smilax*, and on the "Tutu" or "Tut" fruit, which formed the contents of the stomachs of the birds I personally examined.

18. CHARADRIUS BICINCTUS.

Charadrius bicinctus, Buller, op. cit. ii. p. 3.

19. THINORNIS NOVÆ-ZEALANDIÆ. (Plate XIV. figs. 5, 6, egg ; Plate XV. fig. 2, young.)

Thinornis novæ-zealandiæ, Buller, op. cit. ii. p. 11.

This bird is found on the Rangitūhī, or the Sisters, a group of rocks to the north-west of Wharekauri, and on Mangare, whence my specimens were obtained. Its breeding-ground is confined to the Chatham Islands ; stragglers only have been obtained in New Zealand.

The young of this group are very difficult to describe in words so as to convey any idea of their coloration. Mr. Keulemans's excellent figure, given on Plate XV. fig. 2, explains itself.

The eggs of this species are in shape pyriform. Their dimensions are :— 1.42×1.02 , 1.47×1.01 , 1.40×1.01 , 1.40×1.0 . Their ground-colour is olive-buff, marked pretty evenly all over, but more abundant at the larger end, with fine spots and fine linear streaks and markings of clove-brown, often becoming almost black. The *Thinornis* lays three eggs.

20. *GALLINAGO PUSILLA*. (Plate XIV. figs. 1, 2, egg; Plate XV. fig. 1, young.)

Gallinago pusilla, Buller, op. cit. ii. p. 33.

The eggs of this Snipe are now described and figured for the first time. In shape they are ovoid; in dimensions: 1.5×1.12 , 1.67×1.15 , 1.5×1.1 , 1.67×1.12 . The ground-colour varies from a dark pinkish to a dark ochraceous buff, covered with dark seal-brown spots and smudges, more thickly crowded round its widest circumference. Some specimens have pale lavender-grey blotches and spots round that region, which are more sparsely distributed over the rest of the egg. The smaller end is nearly free from spots.

Through the kindness of the Editor, I am able to give a figure of the young of this species also.

My correspondent, Mr. Hawkins, writes me as to the habits of this bird:—"This Snipe has all the habits of the Rail, feeding at night, and making a twittering noise while so doing. During the day it hides in hollow trees and in bunches of thick undergrowth—in fact, wherever it is dark. When the young are first hatched they feed in the day-time; but in about a week they feed at night. This bird lays three eggs."

21. *LIMOSA NOVÆ-ZEALANDIÆ*.

Limosa novæ-zealandiæ, Buller, op. cit. ii. p. 40.

22. *LARUS DOMINICANUS*.

Larus dominicanus, Buller, op. cit. ii. p. 47.

23. *LARUS SCOPULINUS*.

Larus scopulinus, Buller, op. cit. ii. p. 55.

The eggs of this species vary in shape from a rotundo to an ellipso-ovoid; their dimensions are as follows:— 2.19×1.47 , 2.19×1.5 , 2.10×1.47 , 2.19×1.57 , 2.10×1.52 , 2.09×1.5 , 2.19×1.5 , 2.0×1.6 , 2.10×1.47 , 2.12×1.45 . In ground-colour the eggs vary very much from cream-colour through olive-buff to an olive; they are spotted sometimes sparsely all over, sometimes chiefly round the widest circumference, sometimes evenly and thickly all over. The spots are of three shades of colour, from tawny olive to cinnamon,

French-grey, and cinereous. In the darker drab eggs the spots are blotchy and dirty brown. One specimen has a ring of pale sea-green near its pointed end.

24. *LARUS BULLERI*.

Larus bulleri, Buller, op. cit. ii. p. 58.

25. *STERNA FRONTALIS*.

Sterna frontalis, Buller, op. cit. ii. p. 68.

The eggs of this species vary in shape from a narrow to a rounded ovoid; their dimensions are 1.9×1.2 , 1.85×1.2 , 1.8×1.22 , 1.8×1.2 , 1.87×1.25 , 1.77×1.2 . The ground-colour varies from olive-buff to rich cream-buff, the spots and blotches varying from seal- to olive-brown, tawny olive, and blue-grey fading to faint pearl. These markings are sometimes small and distributed more or less generally over the egg, though always more abundant round its larger circumference. In some specimens they are few and large, while in others there is a long confluent blotch round the larger circumference.

26. *STERNA ANTARCTICA*.

Sterna antarctica, Buller, op. cit. ii. p. 70.

27. *STERCORARIUS ANTARCTICUS*.

Stercorarius antarcticus, Buller, op. cit. ii. p. 63.

This bird has a very wide distribution:—The Falkland Islands, Kerguelen Land, St. Paul's Rocks, Tristan d'Acunha, Cape of Good Hope, Madagascar, the Crozets, New Zealand, Norfolk Island, the Chatham Islands, Campbell and Macquarie Islands.

The eggs of this bird vary from ovate to cylindrical-ovate in shape. Their ground-colour varies from cream-buff to tawny drab, covered with spots and blotches, more abundant at the thick end and round their greater circumference; the spots vary from umber and olive to faecal brown or black, interspersed with others of faded lavender. The following are the dimensions of four specimens:— 3.02×2.12 , 3.1×2.1 , 3.1×2.17 , 3.0×2.1 .

28. *PORPHYRIO MELANONOTUS*.

Porphyrio melanonotus, Buller, op. cit. ii. p. 79.

This Blue Water-hen is still abundant in the larger islands.

29. PORPHYRIO CHATHAMENSIS.

Porphyrio chathamensis, Sharpe, Cat. B. xxiii. p. 202.

Dr. Sharpe has kindly supplied me with the following diagnosis of his new species :—

“*Similis P. bello*, sed gutture toto nigro, pileo concolore ; præpectore saturate cyanco : tibiis nigris, abdomine imo concoloribus.”

“The tints are difficult to describe, but the differences are well seen on comparison with *P. bellus*.”

30. ORTYGOMETRA TABUENSIS.

Ortygometra tabuensis, Buller, op. cit. ii. p. 101.

These little Rails frequent the grassy swamps and the dense rush-like terahina-scrub. As they almost never take to flight, they are very rarely seen. We hunted with a dog well trained to the capture of these birds in the grass by running them down; but it was only after a many-hours' hunt that we succeeded in securing a specimen. It was evident from the behaviour of the dog that there was a fair number of birds, but they can move between the stems so fast that they are able to make good their escape in nearly every case of pursuit.

In New Zealand I have had these birds brought in dead but unharmed by our domestic cat. Besides the case recorded by Sir W. Buller, I have known this to occur not unfrequently in different parts of the country. My own cat used to devour in secret birds, rabbits, and hares, which she was very expert in catching, while she would bring in and lay down unharmed on the floor these little Rails.

31. ORTYGOMETRA AFFINIS.

Ortygometra affinis, Buller, op. cit. ii. p. 103.

32. CABALUS DIEFFENBACHI.

Cabalus dieffenbachii, Buller, op. cit. ii. p. 121.

No other than the type-specimen of this species, which is in the British Museum, has ever been met with. “A new kind of Rail,” says Dr. Dieffenbach in his paper read before the Royal Geographical Society, “was formerly very common, but since cats and dogs have been introduced it has

become very scarce. The natives call the bird *Meriki*, and catch it with nooses. I often heard its short shrill voice in the bush, and after much trouble obtained a living specimen"—which has proved to be the last of its race. The abundance of its remains in the Wharekauri sand-hills indicates that it must have once been very numerous.

This Crake lived on Wharekauri, but its remains, though not uncommon there, have not yet been found elsewhere.

33. *CABALUS MODESTUS*. (Plate XIV. fig. 4, egg.)

Cabalus modestus, Buller, op. cit. ii. p. 123.

Cabalus dieffenbachii (young), H. O. Forbes, Bull. Brit. Orn. Club, i. p. xx (1892).

Cabalus modestus, H. O. Forbes, Bull. Brit. Orn. Club, i. p. xlvii (1893).

This has been so rare a bird that up till November 1892 only two specimens were known—the type, which has totally disappeared for years, and the example I received at that date from my correspondent, Mr. Hawkins. The plumage of this latter bird was so remarkable that, notwithstanding the opinion of Count Salvadori to the contrary, I could not but believe that it was a young bird, and the young of *Cabalus dieffenbachii*. It was only on the receipt of further specimens that I was convinced that this distinguished ornithologist was quite right and that they were adult birds. They possess “in their adult plumage the exact dress which might have been expected to characterize the young of *C. dieffenbachii*”*. “The young ones,” writes Mr. Hawkins, “are always the same colour as the old. They nest in holes in the ground, and when the young are hatched they get into fallen hollow trees. They live on insects, principally the sand-hoppers [Crustacea Amphipoda], which travel into the bush here a long way. There is no sand at all on the island [Mangare] where the birds are.”

The egg of this bird, of which only one specimen has as yet been discovered, is nearly white, but its Ralline character is indicated by a faint double spotting of grey and rufous. It measures, axis 1.45, and in diameter 1.1.

* R. B. Sharpe, Bull. Brit. Orn. Club, i. p. xlvii.

This species is now confined to the islet of Mangare, where I fear its fate is sealed, owing to the recent introduction of cats into its hitherto foeless home.

Bones referable apparently to this species have, however, been found among the sub-fossil remains in Wharekauri.

34. ARDEA EGRETTEA.

Ardea egretta, Buller, op. cit. ii. p. 124.

This bird was at one time abundant, I was told, on the islands of this group; but it has become, if not absolutely extinct, extremely rare. Just before my visit (in 1892) a pair had arrived in a very exhausted condition, and fell a prey in a few days to the gun of a native. My correspondent, Mr. Hawkins, tells me that two pairs have arrived on Wharekauri (the main island) since my visit. This bird is now rare on New Zealand itself; but as it has a very wide range, it is not easy to discover from what land the few examples that have arrived recently have come.

35. BOTAURUS PÆCILOPTILUS.

Botaurus pæciloptilus, Buller, op. cit. ii. p. 141.

The Maori name for this bird is *Matuku*.

36. PHALACROCORAX NOVÆ-HOLLANDIÆ.

Phalacrocorax novæ-hollandiæ, Buller, op. cit. ii. p. 145.

37. PHALACROCORAX BREVIROSTRIS.

Phalacrocorax brevirostris, Buller, op. cit. ii. p. 168.

38. PHALACROCORAX FEATHERSTONI.

Graculus africanus, Hutton, Tr. N.Z. Inst. v. p. 224 (1872).

Phalacrocorax featherstoni, Buller, op. cit. ii. p. 166.

The eggs of this species are in colour and shape similar to those of *P. rothschildi*. In size they vary slightly: 2.25×1.35 , 2.25×1.40 , 2.30×1.50 , 2.40×1.50 .

39. PHALACROCORAX ONSLOWI, sp. n.

Phalacrocorax imperialis, Buller, op. cit. ii. p. 153.

Phalacrocorax cirrhatus, Hutton, Tr. N.Z. Inst. xi. p. 336 (1879).

In his 'Birds of New Zealand,' Sir Walter Buller, in both editions, describes and figures the same species of Cormorant from the Chatham Islands—in the first edition under the name

of *P. carunculatus*, and in the second under *P. imperialis*. *P. imperialis* was first described by Captain King on his return from the Straits of Magellan, where he discovered the species. His account specifies that his bird was a crested Cormorant, with the hind neck and the upper surface of the body deep purple; wings and scapulars greenish black; remiges and rectrices (of which there were 12) fuscous black; the underside of the body, the alar bars, and a spot in the middle of the back greyish white; the beak black and the feet yellow. Now this description agrees, with the exception of the crest, with the specimens more recently brought from the Straits of Magellan, now in the British Museum. Of these, one was brought back by the 'Challenger,' and was figured as *P. imperialis* by Mr. Selater in his Report on the 'Challenger' Birds, p. 120, pl. xxv. No one who compares the figures I have referred to can for a moment doubt their distinctness. The figure in the second edition of Sir Walter Buller's 'History' clearly shows how inefficient chromolithography is to represent the coloration of certain species of birds. The figures in both editions have been prepared, it appears, from the same specimen, and yet they are scarcely recognizable as of the same bird. The crest in the figure of the first edition is steel-blue with a slight tinge of green, and the neck and back steel-blue, whereas in the chromolithographed plate in the second edition there is no sign of blue, only bright green; yet the description states that these parts are "steel-blue, with a beautiful gloss." It will be apparent on comparing Mr. Selater's figure of *P. imperialis* with the better of Sir Walter Buller's two figures, that is of *P. carunculatus* in the first edition of his book (which is = *P. imperialis* of the second edition), that the dark feathering in the former commences opposite or just under the eye, and then continues backward to the hind neck, while in the latter it commences at the lower edge of the mandibles, and then retreats toward the hind neck, covering, however, much more of the sides of the neck than in *P. imperialis*. The naked skin in front of and round the eye in the two species is also totally distinct, being bright orange in the Chatham-

Island and gamboge-green in the Magellan birds. Sir Walter's description of *P. imperialis* also conflicts with itself in several points. In describing the young of this Chatham-Island bird he says "lower back and rump glossed with steel-blue *instead of green* as in the adult," and "there is likewise a blue gloss intermixed *with the green* on the head and hind neck"; whereas his words in describing the adult on the same page are: "back, rump, thighs, and upper tail-coverts dark purplish or steel-blue," and "head, including the crest, cheeks, hind part and sides of neck . . . dark purplish or steel-blue with a beautiful gloss."

The mid-line of the gular region in the Chatham-Island bird is plumose, while in the S.-American form it is not so. The bird from the former locality is also described in the work cited as "having the feathers composing the alar bar largely tipped with white," while in the latter the bar is formed of a line of white feathers in the wing-coverts.

From the fact that in some birds in mature and splendid plumage there occurs either no dorsal spot or no alar bar, and that in others both alar bar and dorsal spot are wanting, I am very strongly of opinion that both these characters are neither sexual nor seasonal, but truly specific. In the young of those species which ultimately have an alar bar, it appears in the young birds, but at what precise age I am unable to say, as a pale line in the grey of the wing, as may be seen in the young of *Phalacrocorax imperialis* from the Straits of Magellan, in *P. albiventris*, and in *P. rothschildi* (a new species which I describe below) in the collection of the British Museum. Sir Walter Buller states that the young birds of *P. carunculatus* (that is, the New-Zealand bird) in their first year's plumage have no dorsal spot and no alar bar. Both these characters must, therefore, appear after the first year. In none of the specimens of *P. albiventris* in the British Museum which I have examined (and there are some of them quite mature and in magnificent plumage) is there any dorsal spot. Mr. Selater has pointed out that in none of the examples of *P. verrucosus* is there the slightest appearance of either a dorsal spot or an alar

bar, and I have re-examined these specimens and have found this to be so. I therefore believe that the alar bar appears after, perhaps, the first year, and that only after several further moultings does the dorsal patch present itself, increasing in extent with the greater maturity of the bird. The dorsal patch does not occur in its greater extent in *P. rothschildi* till after the bird is fully adult and after it has even bred. In two specimens of this species, both in beautiful feathering, with distinct not antrorsal crests (one more marked than the other) and in breeding plumage, which have been sent to me along with the eggs, the dorsal spot is small and not well developed ; in another, obtained by Von Hügel at the Bluff, in the South Island of New Zealand, it is more developed ; while in a fourth (from the Chatham Islands) it is still larger, and is accompanied by two scapular patches of white, very similar to those described by Sir Walter Buller as occurring in *P. carunculatus* from New Zealand. In two other immature specimens from the Bluff, from the collection of Von Hügel, this spot is wanting. In all these specimens the alar bar is present. Out of four specimens of *P. imperialis* in the British Museum (three young and one old), all of them have the alar bar and only the mature one the dorsal spot.

There can be little doubt but that almost all Cormorants assume a more ornamental plumage during the breeding-season, and the crest is, I believe it will be found, one of those adornments that appear during that season. Mr. Hawkins writes me in reference to the species now under discussion : " When they pair off for breeding both the males and the females get crests, and as soon as the young can leave the nest the parents lose their crests and become plain and quite ugly. The male and female take turn about at hatching. When making their nests they don't hesitate to rob another nest if the owners are away from home." The examples of *P. imperialis* from the Magellan region have no distinct crest either in the specimen in the British Museum or in that figured by Mr. Selater ; but their coronal feathers are slightly elongated and are *green*, whereas in the

Chatham-Island form the crest, according to Sir W. Buller's text (not his plate in the second edition), is of the same colour as the back and neck, "dark purplish or steel-blue." The carunculations also are developed apparently during the breeding-season. Buller's figure of *P. imperialis* (= *P. onslowi*) has no carunculations, while Selater's from South America shows them.

As the type of *P. imperialis* of King was a Magellan Straits' specimen, this name must necessarily be retained for the South-American form, so that, if Sir W. Buller is right in separating the New-Zealand from the Chatham-Island birds, under the name of *P. carunculatus*, the bird from the Chatham Islands requires a new name. I have therefore taken the liberty of associating with it that of the Earl of Onslow, to whom ornithologists are deeply indebted for the measures he instituted, when Governor of New Zealand, for the protection of the singular but fast-vanishing avifauna of those islands, as well as on account of the personal interest he has taken in the *Phalacrocoracide* of that colony. Mr. F. W. Hutton has proposed to designate the Chatham-Island Crowned Shag as *P. cirrhatus* of Gmelin; but this is inadmissible, if not on other grounds, for the reason that Gmelin's type had 14 rectrices, while *P. imperialis*, *carunculatus*, *onslowi*, *colensoi*, and *rothschildi* all have only 12.

Phalacrocorax onslowi inhabits Rangitutahi, or the Sisters, a few rocky islets to the north of the main island.

40. PHALACROCORAX ROTHSCILD1, sp. n.

This is a more beautiful species in my estimation than any of the others from the Southern Ocean. At first I was inclined to place it under *P. colensoi* of Buller, but the description given by him in the 2nd edit., vol. ii. p. 161, of his 'Birds of New Zealand,' differs in so many respects from the bird I have received from the Chatham Islands, that I find myself under the necessity of describing it as a new species under the name of *P. rothschildi*, in compliment to the Hon. Walter Rothschild, who has taken so much interest in the birds of the Chatham Islands.

Adult. The feathers on the crown of the head forming a

distinct, though not very tall or conspicuous, crest, and on the cheeks and sides of the head, as far back as the posterior end of the rami of the mandible, also elongated, forming a Grebe-like ruff, all rich glossy green. Occiput, head, and lower neck, an interseapular line, back, rump, and thighs very dark purple or deep steel-blue, richly glossed. Shoulders, mantle, and wing-coverts olive-green, the middle wing-coverts white, forming a long and conspicuous alar bar; on the back a squarish patch of white, more or less distinctly divided into two, which appears not to be developed in birds of the first year, but becomes more marked with maturity. I have described above the changes that take place in this species, while speaking of *P. onslowi*. The gular region has a deeply feathered line of white, commencing in front of the level of the eye; this expands slightly under the throat into a white stripe of dense and elongate feathers, separating the green ruff (above spoken of) as far back as the posterior end of the rami of the mandible, where the white stripe expands (in shorter feathers) on the sides of the fore neck and still more on the front of the lower neck, thus constricting the rich blue on the upperside of the lower neck opposite where it begins to change into the green of the mantle. This approximation of the dark feathers of the head is very characteristic; the whole of the rest of the underside is pure white. Bare skin in front of, round the eye, and around the gape, with the carunculations on the sides of the face, orange-red. Bill dark brown. Legs and feet orange. Wing-feathers black, washed with olive-green. Under surface of quills blackish brown. Tail-feathers 12 in number, dull black, with the shafts white at base. Total length 24·5–27·75 inches, wing from flexure 10·5–11, tail 4·75–5, tarsus 2·42.

Under his description of *P. colensoi*, Sir W. Buller observes that “in the British Museum there are two examples (in moulting condition) obtained by Baron A. von Hügel at the Bluff, in the provincial district of Southland,” New Zealand. I have examined these two skins as also a third in the same collection, also obtained from the same locality by Von Hügel, and there can be no doubt that they

all belong to the same species as that I am now describing from the Chatham Islands. But there can be as little doubt that they do not agree with Sir Walter Buller's description. That author says :—"The adult is similar to *P. carunculatus*, but conspicuously less; it is *without* carunculations; posterior portion of back slightly marked with a white spot. *Crown of the head, shoulders, feathers composing the mantle, wing-coverts, and scapulars bronzy brown*, with a green gloss in certain lights; hind part and sides of neck, lower portion of back, rump, and thighs *blue-black* with a fine metallic gloss." He describes also on the same page a young of *P. colensoi*. His species is described from the Auckland Islands, and, on account of Baron von Hügel's specimens, from the south of New Zealand also. Sir Walter also examined many of the "twenty or more specimens" collected in the Auckland Islands by Mr. Burton, of the Colonial Museum, Wellington, N.Z.

Eggs.—This bird, my correspondent informs me, lays three eggs. In form they vary from ellipso-ovoid to cylindrical ovate. Size: 2.32×1.55 , 2.37×1.52 , 2.5×1.6 , 2.35×1.60 , 2.3×1.5 , 2.3×1.52 , 2.37×1.4 , 2.45×1.52 , 2.52×1.50 . The ground-colour is that of all Cormorants' eggs, milky blue, plastered with patches of cream-coloured chalk.

Of the Cormorants, therefore, in the Southern Seas, having a white underside and a steel-blue hind neck and back, there appear to be eight distinct species, which I may characterize shortly, while on the subject, as follows:—

1. *Phalacrocorax onslowi*, mihi, from the Chatham Islands, has the dark colour of the head commencing along the lower edge of the ramus of the mandible. Face and carunculations orange-red; a line on the gular region plumose; an alar bar and doubtfully a dorsal spot of white, as it is absent in the specimen, though mature and crested, described and figured by Sir W. Buller.
2. *Phalacrocorax carunculatus* (Gm.). New Zealand and S. America. This bird has an alar bar and a dorsal spot of white, a feathered gular pouch, and a patch of white

on the outer scapulars. The naked space round the eyes is greyish brown; the raised orbits of a beautiful blue colour; caruncles orange-yellow. Legs flesh-white at all ages.

3. *Phalacrocorax rothschildi*, mihi. Chatham Islands and south of New Zealand. This species is at once distinguished by the approximation of the dark plumage of the head beneath the throat, leaving a comparatively narrow white stripe between them. White alar bar and dorsal spot. Feathers elongated into a crest on the top of the head, and elongate feathers on the sides of the head and under throat. Bare skin about the face orange-red; plumose line on gular pouch.
4. *Phalacrocorax colensoi*, Buller. Auckland Islands. This species can be separated from *P. rothschildi* by the colour of its upper parts being bronzy brown instead of steel-blue. It has an alar bar and a dorsal spot of white, but the adult has no carunculations and no crest according to Sir W. Buller.
5. *Phalacrocorax albiventris*, Less. Falkland Islands and Straits of Magellan. In this bird the dark plumage of the head commences opposite the gape; it has no plumose line along the centre of the gular pouch and no dorsal spot of white, but the alar bar is present. There is one specimen in the British Museum Collection, inseparable, so far as I can detect, from *P. albiventris*, which has no alar bar. It may be an individual variety, or turn out to be of a different species, distinguished from *P. albiventris* by the possession of an alar bar.
6. *Phalacrocorax verrucosus*, Cab. Kerguelen Land [and perhaps N. Zealand]. This bird has neither alar bar nor dorsal spot of white, and can be distinguished also by the dark plumage of the head commencing at the underside of the jaw on the inner side of the ramus of the mandible, the dark blue, almost black, plumage of the sides of the head being separated by a short wedge of white. The top and sides of the head blue. No plumose line along the centre of gular pouch.

One of the specimens collected during the Antarctic Expedition, and presented to the British Museum by the Admiralty, bearing the name "*P. carunculatus*, New Zealand," is undoubtedly *P. verrucosus*. I suspect that there is some error as to the locality, and that not improbably it has become dissociated from the other specimens collected at Kerguelen during that voyage, and presented to the Museum by the Admiralty at the same time. The specimen was probably, therefore, from Kerguelen Land, and not from New Zealand.

7. *Phalacrocorax imperialis*, King. Straits of Magellan, Chili, Chiloe Island. This species is distinguishable from *P. onslowi* by the dark plumage of the head arising opposite to, or a little under, the eye, and not intruding on the fore neck. The bare skin about the face gamboge-green. No plumose line on gular pouch. An alar bar and dorsal spot of white present. Figured in the Report of the Birds collected by the 'Challenger,' plate xxv.

8. *Phalacrocorax cirrhatus* (Gm.) has 14 rectrices.

† 41. DIOMEDEA EXULANS.

Diomedea exulans, Buller, op. cit. ii. p. 189.

The outlying rocky islets off Pitt's and Wharekauri Islands—Pyramid Rock, the Sisters, and the Forty-fours—are some of the chief breeding-places of this species.

The eggs and young are yearly collected in thousands by the Maoris for food-purposes.

† 42. DIOMEDEA MELANOPHRYS.

Diomedea melanophrys, Buller, op. cit. ii. p. 198.

43. PELECANOIDES URINATRIX.

Pelecanoides urinatrix, Buller, op. cit. ii. p. 207.

Eggs.—These vary in form from oval to nearly round and are more or less pointed at one end; ground-colour white. Dimensions: 1.40×1.15 , 1.40×1.10 , 1.50×1.10 , 1.35×1.10 , 1.40×1.15 , 1.30×1.10 , 1.50×1.11 , 1.45×1.15 , 1.30×1.10 .

44. PELECANOIDES BERARDI.

Pelecanoides berardi, Buller, op. cit. ii. p. 208.

This bird breeds on Pitt's Island.

45. PRION TURTUR.

Prion turtur, Buller, op. cit. ii. p. 209.

46. PRION VITTATUS.

Prion vittatus, Buller, op. cit. ii. p. 212.

Eggs.—Elongate, ellipsoid, and sometimes wider at one end than the other. Dimensions: 2.2×1.39 , 1.91×1.40 , 1.80×1.30 , 1.88×1.40 . Colour yellowish white.

+ 47. ŒSTRELATA AXILLARIS.

Œstrelata axillaris, Salvin, Bull. Brit. Orn. Club, i. p. xxxiii.

+ 48. OSSIFRAGA GIGANTEA.

Ossifraga gigantea, Buller, op. cit. ii. p. 225.

+ 49. PUFFINUS GRISEUS.

Puffinus griseus, Buller, op. cit. ii. p. 232.

The eggs vary in form from ovate to rotundo-ovate and oblongo-ovate. Colour white. Dimensions: 3.1×2.15 , 3.2×2.0 , 2.85×1.95 , 3.0×1.95 , 3.2×2.0 , 2.8×2.02 , 3.1×2.1 , 3.1×1.9 , 2.7×1.82 , 3.1×1.9 , 3.02×1.9 .

+ 50. PELAGODROMA MARINA.

Pelagodroma marina, Buller, op. cit. ii. p. 248.

Eggs.—Elliptical in shape. Dimensions: 1.4×1.0 , 1.4×1.0 . Ground-colour white at one end, covered with fine dots of heliotrope-purple and lavender-grey, with a few of seal-brown interspersed, and at the other end sparsely with vinaceous buff. In some specimens the end is thickly dusted over with the finest vinaceous-rufous dots, while on the rest of the egg they are scarcely recognizable.

51. GARRODIA NEREIS. (Plate XIV. fig. 3, egg.)

Garrodia nereis, Buller, op. cit. ii. p. 247.

Egg.—Form short ellipsoid. Dimensions: 1.2×1.0 . Ground-colour white, on which are a ring of drab-reddish and fine hair-like streaks round one end.

This bird is found both in New Zealand and on the Snares.

52. *ANAS SUPERCILIOSA*.

Anas superciliosa, Buller, op. cit. ii. p. 251.

53. *RHYNCHASPIS VARIEGATA*.

Rhynchaspis variegata, Buller, op. cit. ii. p. 269.

54. *EUDYPTES PACHYRHYNCHUS*.

Eudyptes pachyrhynchus, Buller, op. cit. ii. p. 287.

55. *EUDYPTULA MINOR*.

Eudyptula minor, Buller, op. cit. ii. p. 300.

The eggs of this bird are rotundo-ovate and of a white colour. In size they are as follows:— 2.3×1.7 , 2.2×1.7 , 2.2×1.7 , 2.35×1.75 , 2.15×1.65 , 2.15×1.70 , 2.25×1.7 .

It will be seen from this list that the birds still existing in the Chatham group are 55 in number, besides two introduced European species (*Alanda arvensis* and *Passer domesticus*). Since the publication of the second edition of Sir Walter Buller's 'History' in 1889, six new species have been discovered there, namely, *Cyanorhamphus forbesi*, *Carpophaga chathamensis*, *Porphyrio chathamensis*, *Phalacrocorax rothschildi*, *P. onslowi*, and *Æstrelata axillaris*. There occur on the Chatham Islands 13 species which, so far as is known, are endemic. Since Dr. Sharpe has relegated the *Ocydromus sylvestris*, Sel., of Lord Howe's Island, to the genus *Cabalus*, the Chatham Islands have been deprived of their sole supposed endemic genus among their living forms. My investigations among the remains of their former, but now extinct, bird-life have brought to light the fact that many other species, some of them well-known New-Zealand birds, were once abundant in these islands. It may be interesting to enumerate the extinct species so far identified.

List of Extinct Species.

[1.] *PALEOCORAX MORIORUM*, Forbes.

Palæocorax moriorum, H. O. Forbes, 'Nature,' vol. xlv. p. 252; Bull. B. O. C. i. p. xxi.

This aberrant Raven seems to have also occurred in New Zealand, associated with a smaller species on the North Island, for which I propose the name of *P. antipodum*.

[2.] *NESTOR NOTABILIS*, Gould.

Portions of the skeleton sufficient to identify the occurrence of this species have been found.

[3.] *NESTOR MERIDIONALIS*, Gm.

The same remark applies here. Mr. A. Shand, a gentleman who was born in Wharekauri, and a good observer, and Tapu, an aged Moriori, informed me that the Kakapo, *Stringops habroptilus*, occupied, in the early days of the Settlement, various parts of Wharekauri in considerable numbers, and both remember their burrows, though the former cannot recall having himself seen the birds. I did not, however, succeed in finding any of their remains, nor has my correspondent, Mr. Hawkins, been more successful.

[4.] *SCELOGLAUX ALBOFACIES* (Gm.).

Portions of the skeleton of several specimens.

[5.] *HARPA NOVÆ-ZEALANDIÆ* (Gm.).

[6.] *HARPA FEROX*, Peale.

[7.] *COLUMBA*, sp.

I have not yet been able to assign the crania of a Pigeon that I have received to any known species.

[8.] *CABALUS DIEFFENBACHI* (Gray).

The remains of this bird are sufficiently abundant to show that it must have been once quite common.

[9.] *CABALUS MODESTUS*, Hutton.

I have obtained sub-fossil remains from Wharekauri. This is the species I have designated as *Ocydromus pygmaeus* in 'Nature,' vol. xlv. p. 252.

[10.] *PALÆOLIMNAS* (gen. nov.) *NEWTONI*, Milne-Edwards.

This is the bird I have elsewhere ['Nature,' xlv. p. 252] referred to under the name of *Fulica newtoni*. The limb-bones and pelves correspond so closely to those of *F. newtoni*, from Mauritius, that I have not been able to separate them.

The head of the type is, however, unknown. Among the bones from the Chatham Islands, collected by myself, were several heads which I was unable to allocate to any known genus. Of these I have recently received additional specimens, and I have been able to decide that they belong to the bird the limb-bones and pelves of which I had identified as belonging to *Fulica newtoni*. They indicate a form of Rail so aberrant that they must be removed from the genus *Fulica*. The most remarkable points in the structure of the skull are its extraordinarily curved form, the deeply marked glandular impressions over the eyes, and the great pneumaticity of the frontal bones.

Remains of a species, if not the same a very closely related one, have been discovered by Mr. A. Hamilton in New Zealand in the cave in Otago, whence he obtained some remarkably complete skeletons of *Aptornis* (of which a specimen has lately been acquired for the Geological Department of the British Museum) associated with remains of *Stringops*, *Notornis*, *Dinornis*, *Harpagornis*, and other, now vanished, species of its bird-fauna.

[11.] *APHANAPTERYX HAWKINSI*, Forbes.

Aphanapteryx hawkinsi, H. O. Forbes, 'Nature,' vol. xlv. p. 252; Bull. B. O. C. i. p. 1.

This bird must have been abundant at one time in Wharekauri, to which island it was apparently confined.

[12.] *OCYDROMUS ?AUSTRALIS*, Sparrm.

One or two bones which occur in the collection apparently belong to this species.

[13.] *GALLINAGO CHATHAMICA*, sp. n.

A very much larger species than *G. pusilla*. The bill is 3 inches in length.

[14.] *HÆMATOPUS UNICOLOR*, Wagl.

[15.] *CHENOPIS SUMNERENSIS*, Forbes.

This is the same species as I discovered in the Sumner Cave in New Zealand (*cf.* Trans. N.Z. Inst. xxiv. p. 188). It must have been enormously common on Wharekauri.

[16.] *ANAS* sp. inc.

[17.] *FULIGULA NOVÆ-ZEALANDIÆ* (Gm.).

EXPLANATION OF THE PLATES.

PLATE XIV.

- Figs. 1, 2. Egg of *Gallinago pusilla*, p. 529.
 3. Egg of *Garrodia nereis*, p. 542.
 4. Egg of *Cabalus modestus*, p. 532.
 5, 6. Egg of *Thinornis novæ-zealandiæ*, p. 528.

PLATE XV.

- Fig 1. Young of *Gallinago pusilla*, p. 529.
 2. Young of *Thinornis novæ-zealandiæ*, p. 528.

XLVIII.—*Bornean Notes*. By R. BOWDLER SHARPE,
 LL.D., F.L.S., &c.

THE following notes embody my observations on several collections from Sarawak and Northern Borneo, submitted to me by Mr. Charles Hose, Mr. A. H. Everett, and Mr. Edward Bartlett, the Curator of the Sarawak Museum.

I have divided these notes into the following headings:—

- I. First List of Birds from Mt. Kalulong, in Sarawak :
p. 546.
- II. A List of the Birds collected by Mr. A. H. Everett on
Mt. Penrisen and Mt. Poeh, in Sarawak : p. 550.
- III. Description of a new *Spilornis* from Borneo : p. 552.
- IV. A Note on the *Baza* of Borneo : p. 553.
- V. Notes on Mr. A. H. Everett's Collections of Birds from
Northern Borneo and Sarawak : p. 559.
- VI. Additions to the Avifauna of Mount Kina Balu : p. 560.
- VII. Description of the Nest and Eggs of *Staphidia everetti* :
p. 563.

I. *First List of Birds from Mt. Kalulong, in Sarawak.*

A small collection of birds from Mt. Kalulong has recently been made for Mr. Charles Hose by his hunters. The present paper can be regarded only as a preliminary list of the avifauna of the mountain, as no altitudes have been marked by the native hunters, and it is evident that they have not as yet collected at any great height. It will be seen that some of the peculiar Kina Balu forms occur on Kalulong also.

1.



2.



3.



4.



5.



6.





d. G. Kaudernus del. et lith.

GALLINAGO PUSILLA, pulli. THINORNIS NOVAE ZEALANDIAE, pulli.